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ROTARY TOOTHBRUSH

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Claims

1. A rotary toothbrush comprising:  
a long main body;  
a disk-shaped rotary brush with bristles oriented approximately in the axial direction on the circumference;  
a shaft device for fitting said rotary brush, which rotates about a shaft horizontal to the long main body;  
a device that drives the rotary brush to rotate repeatedly;  
and a straight brush is installed on the rotary brush, such that when the rotary brush rotates repeatedly with bristles facing away from the axial direction, it undergoes a linear back-and-forth movement along the length of the toothbrush.

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<sup>1</sup> [Translator's note: Proper names are transliterated from Chinese.]

2. The rotary toothbrush of Claim 1, further comprising a second straight brush installed on the rotary brush, such that when the rotary brush is rotating repeatedly, it undergoes a linear back-and-forth movement along the length of the toothbrush, and that the bristles of the second straight brush facing away from the axial direction are opposite the bristles of the other straight brush.

3. The rotary toothbrush of Claim 2, wherein a plurality of devices are equipped, including a device that applies a driving force to rotate the rotary brush.

4. The rotary toothbrush of Claim 2, wherein a plurality of devices are equipped, including a long arm, the purpose of which is to make possible back-and-forth movement along the length of the toothbrush, and one end of said arm is connected to one of the straight brushes.

5. The rotary toothbrush of Claim 3, further comprising a guide arm projecting from the other straight brush and a plurality of devices for maintaining the guide arm in a fixed direction where sliding against the long arm.

6. The rotary toothbrush of Claim 2, further comprising a second disk-shaped rotary brush facing the first rotary brush and having bristles oriented approximately in the axial direction on the circumference; and a second shaft device equipped for the second rotary brush which rotates about the shaft, and also having a straight brush equipped on the second rotary brush, such that when the rotary brush is rotating repeatedly, it undergoes a linear back-and-forth movement.

7. The rotary toothbrush of Claim 6, wherein a plurality of devices are equipped comprising a device that applies a driving force to rotate one of the rotary brushes.

8. The rotary toothbrush of Claim 6, wherein a plurality of devices are equipped including a long arm, the purpose of which is to make possible a back-and-forth movement along the length of the toothbrush, and one end of said arm is connected to one of the straight brushes.

9. The rotary toothbrush of Claim 8, wherein the second end of said long arm is connected to a linear back-and-forth drive shaft; said long arm has a high and narrow channel extending from the second end and a channel beginning at a distant point from the second end while penetrating it transversely; the front end of the drive shaft has a size and shape that fits into the high and narrow channel and the front end portion ends slightly behind the drive shaft, such that the drive shaft can be inserted into the high and narrow channel, while also moving forward into the transverse channel, where the opposing rotations of the long arm and the drive shaft cause the front end of the drive shaft to lock in tightly in the transverse channel.

10. The rotary toothbrush of Claim 1, further comprising an approximately disk-shaped second rotary brush facing the first rotary brush and having bristles oriented approximately in the axial direction on the circumference; and a second shaft device equipped for the second rotary brush for rotating about said shaft; while also having a straight brush equipped on the second

rotary brush, such that when the rotary brush is rotating repeatedly, it undergoes a linear back-and-forth movement.

11. The rotary toothbrush of Claim 10, wherein a plurality of devices are equipped comprising a device to apply a drive force to rotate one of the rotary brushes.

12. The rotary toothbrush of Claim 10, wherein a plurality of devices are equipped, including a long arm, the purpose of which is to make possible a back-and-forth movement along the length of the toothbrush, and one end of said arm is connected to one of the straight brushes.

13. The rotary toothbrush of Claim 12, further comprising a guide arm projecting from the other straight brush and a plurality of devices for maintaining the guide arm in a fixed direction while sliding against the long arm.

14. The rotary toothbrush of Claim 12, wherein the second end of said long arm is connected to a linear, back-and-forth drive shaft; said long arm having a high and narrow channel extending from the second end and a channel beginning at a distant point from the second end while penetrating it transversely; the front end of the drive shaft has a size and shape that fits into the high and narrow channel and the front end portion ends slightly behind the drive shaft, such that the drive shaft can be inserted into the high and narrow channel, while also moving forward into the transverse channel, where the opposing rotations of the long arm and the drive shaft causes the front end of the drive shaft to lock in tightly in the transverse channel.

15. The rotary toothbrush of Claim 1, wherein a plurality of devices are equipped, including a device that applies a drive force to rotate one of the rotary brushes.

16. The rotary toothbrush of Claim 1, wherein a plurality of devices are equipped, including a long arm, the purpose of which is to make possible a back-and-forth movement along the length of the toothbrush, where one end of said arm is connected to one of the straight brushes.

17. The rotary toothbrush of Claim 16, wherein the second end of said long arm is connected to a linear, back-and-forth drive shaft; where said long arm has a high and narrow channel extending from the second end and a channel beginning at a distant point from the second end while penetrating it transversely, where the front end of the drive shaft has a size and shape that fits into the high and narrow channel and the front end portion ends slightly behind the drive shaft, such that the drive shaft can be inserted into the high and narrow channel, while also moving forward into the transverse channel, where the opposing rotations of the long arm and the drive shaft cause the front end of the drive shaft to lock in tightly in the transverse channel.

18. The rotary toothbrush of Claim 16, wherein the second end of said long arm is connected to a linear, back-and-forth drive shaft; where said long arm has a pair of corresponding arms projecting from the second end, serving as the extended part of the second end, where each of the corresponding arms has a tapered face facing the other arm, forming a

gap between the two corresponding arms tapering toward the second end; the drive shaft has an oblique terminal with a slope approximately the same as that of the gap between the two corresponding arms; and the oblique terminal is too large to pass through said gap and pressure is exerted to force it to enter the gap, resulting in the opening of the corresponding arms to accommodate the oblique terminal.

19. The rotary toothbrush of Claim 1, further comprising a plurality of devices forming a storage chamber, including a battery set of suitable size and exterior shape to fit in the storage chamber and a plurality of devices that can be used to immobilize the battery set in the storing chamber.

20. The rotary toothbrush of Claim 19, having a charging chamber and an immobilized battery charger with a detachable device, said detachable device being the same as the original part in the toothbrush, and the battery set having at least one rechargeable battery, so that the battery set can be charged by the battery charger and the battery of the toothbrush can be replaced.

#### Brief description of the figures

Figure 1 shows a perspective view of the front end part of the rotary toothbrush of the present invention in a specific embodiment.

Figure 2 shows a dissembled perspective view corresponding to Figure 1, depicting the main parts of the rotary toothbrush.

Figure 3 shows a side view of the toothbrush of Figure 1, displaying additional parts of the rotary toothbrush, where certain parts are shown in a sectional view to illustrate the internal structural details.

Figure 4 shows a sectional view along line 4-4 in Figure 3, depicting the front end part of the rotary toothbrush in a specific embodiment.

Figure 5 shows a schematic sectional view of one end part corresponding to Figure 4, in reduced scale, showing the drive mechanism.

Figure 6 shows the brush structure of the rotary toothbrush in a specific application example.

Figure 7 shows an exploded sectional view, depicting the structural details of the end part of long arm 4.

Figure 8 shows a rear view of another specific application example 140 of back end portion 40 of long arm 4.

Figure 9 shows the sectional view along line 9-9 of Figure 8, as seen in the direction of the arrows, depicting the contraction of shaft 31 into long arm 4, illustrating the mutual relative action.

Figure 10 shows a perspective view of the overall construction in an improved mode of application of toothbrush 1, including a rechargeable battery set.

Figure 11 shows a sectional view similar to the left-hand portion of Figure 4, illustrating another specific application example of the structure of the brush head.

Figure 12 shows a sectional view of the lateral portion of the toothbrush along line 12-12 in Figure 11.

Figure 13 shows an exploded view of the battery charger and battery set utilized in toothbrush 1.

Figure 14 shows a right side view relating to Figure 13, with a sectional view of the bottom portion, to illustrate the structural details of the battery charger and the battery set.

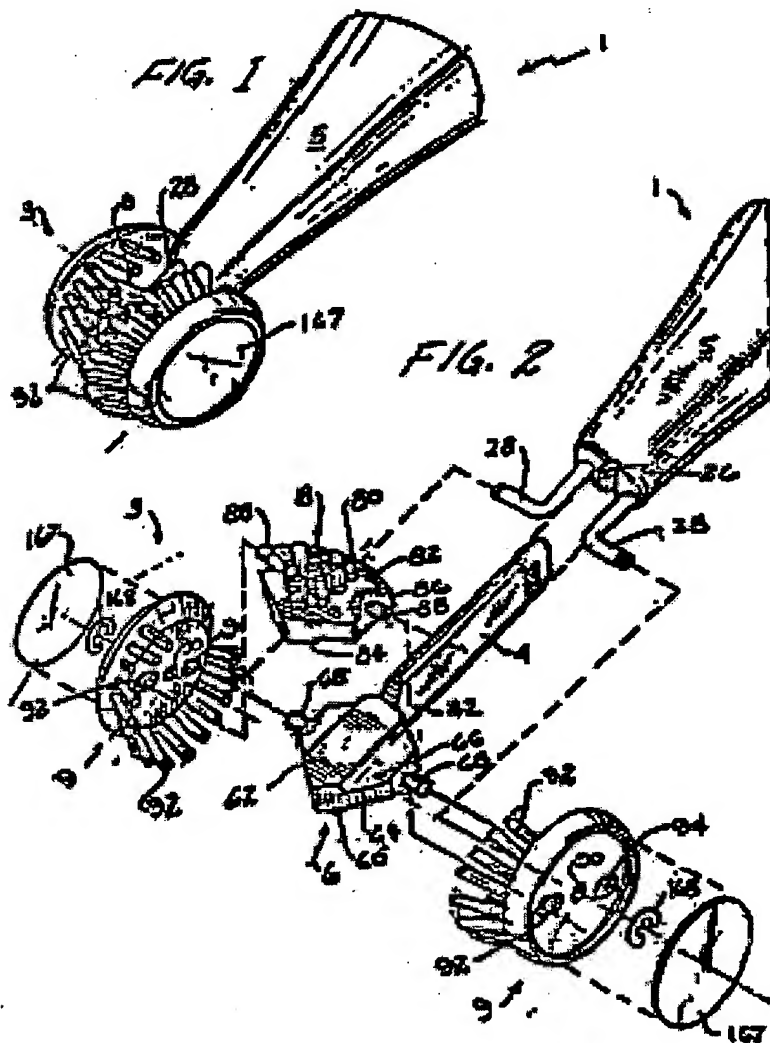




FIG. 5

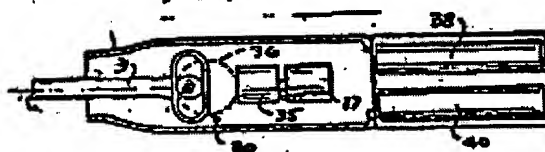


FIG. 6

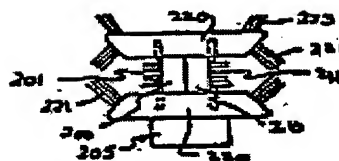


FIG. 7

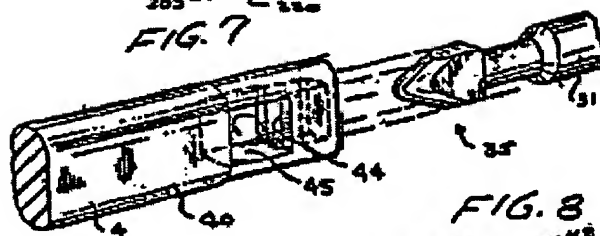


FIG. 9

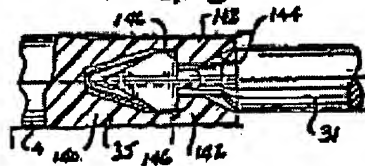


FIG. 10

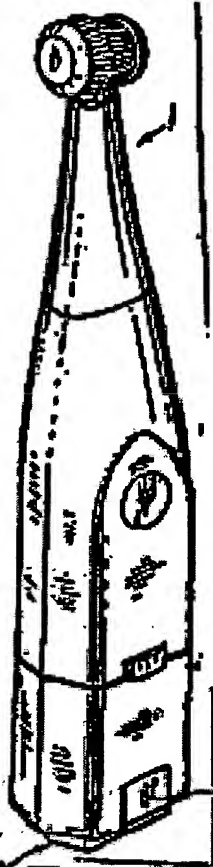


FIG. 13

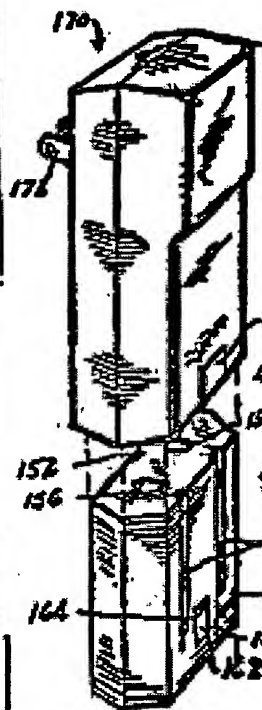


FIG. 14

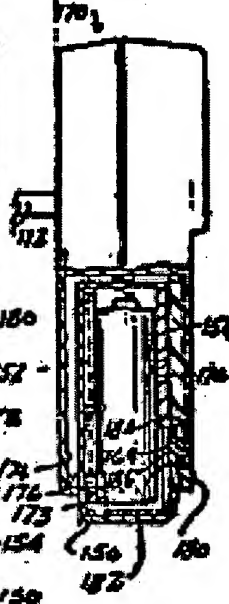


FIG. 12



FIG. 11

